



اَبُو سَيِّدِي تَكُونُو لِي مَبَارَا
UNIVERSITI
TEKNOLOGI
MARA

MEC299 FINAL YEAR PROJECT 1

PROJECT NAME: OIL PALM FRUIT LIFTER

PREPARED BY:

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1.0 Introduction

This paper has outlined the study done to create an oil palm fruit lifter. The research methodology is reviewed, as well as related literature. They are presented and discussed together with the findings. A conclusion wraps up the essay.

1.1 Background of Study

Palm oil industry in Malaysia is one of main contributors of agricultural income in Malaysia. According to the Malaysian Department of Statistics, in 2016, the production of fresh fruit bunch (FFB) from the palm oil industry contributed RM38.5 billion to the overall Gross Domestic Product (GDP) of Malaysia [1]. The palm oil industry consists of the processes of planting, farm management, harvesting and processing before the final product, palm oil, is produced at the mill. The management and harvesting processes have been identified as requiring more manpower compared to the other processes. Harnessing the latest technology and through the use of creative innovations, some of the manual work has been automated and less manpower is needed.

The agricultural industry is one of Malaysia's most important industries; it encompasses a wide range of crops, including cocoa, palm oil, tropical hardwoods, pepper, and tin, which all contribute significantly to the country's economy. Many small farmers take advantage of the potential to transform this area into a source of revenue.

Small farmers that establishing oil palm plantations in the country require a considerable manpower to manage them such as cultivating, cutting down shrubs, harvesting crops, and etc are some of them. The Oil Palm Fruit Lifter is intended to assist smallholder farmers in lowering harvesting expenses. Typically, they must hire foreign workers or agencies to perform harvest services, incurring expenditures due to reduce financial returns. As a result, those with families are unable to sustain themselves on a monthly basis. Hence, in order to assist small farmers, I devised an idea for a machine that would alleviate their burden, which I called the Oil Palm Fruit Lifter. This equipment collects and lifts the fruit of the oil palm tree. Hoyer lifts and forklifts inspired the idea for constructing the Oil Palm Fruits Lifter. The Oil Palm Fruits Lifter operates a hydraulic jack that uses hydraulic fluid as a force to elevate a tray that contain the fresh fruit bunches of palm oil fruit.

The product will also consider the pros and cons that user/customer will get in the future so that the project can make the best outcome through this discussion. After the analysis and design are complete, the ideas and design specification will be combined and the product model will be shown using a 3D simulation which is SolidWorks software.

1.2 Problem Statement

Small farmers that establishing oil palm plantations in the country require a considerable manpower to manage them such as cultivating, cutting down shrubs, harvesting crops, and etc are some of them. The Oil Palm Fruit Lifter is intended to assist smallholder farmers in lowering harvesting expenses.

1.3 Design Objective

The objectives of this project are shown as below:

- I. To design the Oil Pump Fruit Lifter using forklift as reference.
- II. To fabricate a mechanism for small holder farmers to reduce their cost in harvesting crops.

1.4 Scope of Project

The scope is simply all the work that needs to be done in order to achieve a project's objectives. In other words, the scope involves the process of identifying and documenting specific project goals, outcomes, deliverables, technical requirements and limitation.

1.4.1 Project Objectivity

To produce a machine that can help the small farmers reduce the cost of managing their farm.

1.4.2 Deliverable

- A machine that can collect and lift the fruit of the oil palm trees.
- Equipped with a tray that can store and lift the fruits.
- Included safety measures such as lock mechanism.

1.4.3 Technical Requirement

- The machine must meet the design SolidWorks

- The system needs to be able to hold and lift the maximum weight of 150kg (expected to lift about 5 ± FFB once) (1 FFB=16 to 53 kg according to researchgate.net)
- The tray should be able to hold at least 75 kg

1.4.4 Limitation

- If the farm surface is hilly, it will be less efficient because of the wheels.
- Need to perform regularly scheduled maintenance activities to help prevent unexpected failures.

1.5 Significance of the Project

1.5.1 Apply and increase engineering knowledge.

Knowledge is an important element in any field. Oil Palm Fruits Lifter project helps increase engineering knowledge. This is because, in producing the Oil Palm Fruits Lifter, it requires a variety of materials, due to that, various studies have been done through various sources which at the same time provide new info to the designer. Oil Palm Fruits Lifter has also increased the efficiency in using engineering formulas in performing calculations. This is because, these calculations are needed to determine the appropriate size and weight to be lifts by Oil Palm Fruits Lifter.

1.5.2 Improve skill in using engineering software.

Engineering software such as SolidWorks is used in this Oil Palm Fruits Lifter project where it is use to making engineering analysis, 3D drawing and also assembly drawing. While using this software, it has improved the skill and also adding more knowledge about SolidWorks function. Due to that, it will also help engineering students to use of this knowledge in future workplace.

1.5.3 Enhance ability in making creative innovation.

Oil Palm Fruits Lifter project has helped users generate creative ideas from each other's imagination. This is shown when producing sketch drawings to find a suitable design for this Oil Palm Fruits Lifter. Thus, this can also enhance thinking skills in generating thoughtful ideas in the innovation project.

1.6 Expected Result

